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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,660	01/06/2006	Miwa Okubo	09792909-6521	5305

26263 7590 09/15/2010

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EXAMINER	
ZIMMERMANN, JOHN P	
ART UNIT	PAPER NUMBER
2861	

MAIL DATE	DELIVERY MODE
09/15/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/563,660	OKUBO, MIWA	
	Examiner	Art Unit	
	John P. Zimmermann	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 August 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12 MAY 2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 12 May 2010 has been considered by the Examiner.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

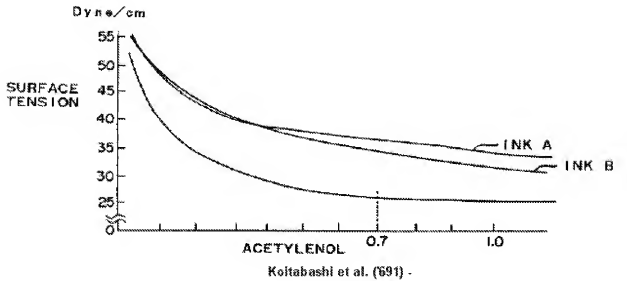
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. **Claims 1-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Koitabashi et al.** (US 6,612,691 B1) in view of **Hirose et al.** (US 5,591,514 A) with reference to the Institute of Electrical and Electronics Engineers (IEEE) and The American Society for Testing and Materials (ASTM): Dictionary.com, Definition of Room Temperature: An indoor temperature of from 20 to 25°C (68 to 77°F) [**Room Temperature**].

a. As related to independent **claim 1,** Koitabashi et al. teaches an ink-jet recording method (Koitabashi et al. – Title) in which recording is executed by discharging inks of a plurality of colors from a discharge opening as droplets of ink to be attached onto a recording material (Koitabashi et al. – Abstract). This method comprises discharging inks of a first color and a second color at an interval of 200 mS or less [i.e. interval of 50mS or at the same time, both of which are less than 200mS] (Koitabashi et al. – Description, Column 12, Lines 13-34 and Column 29, Lines 30-45), using inks having a surface tension of 25 to 45 mN/m [i.e. dyne/cm] at 23° C [i.e. from less than 35 to more than 40 at room temperature (Heater at 0V)] and an ink solvent containing water for each of the inks (Koitabashi et al. – Description, Column 11, Lines 5-16 & Column 7, Lines 40-50 and Table 1 & Figure 47, both shown below).

Koitabashi et al. ('691) - TABLE 1

	Ka value ($ml/m^2 \cdot msec^{1/2}$)	Acetylenol content (%)	Surface tension (dyn/cm)
Topping type (non-penetrative) ink	≈1.0	0.0≈0.2	45≈
Semi-penetrative ink	1.0≈5.0	0.2≈0.7	35≈40
High-penetrative ink	5.0≈	0.7≈	≈35



Koitabashi et al. ('691) -

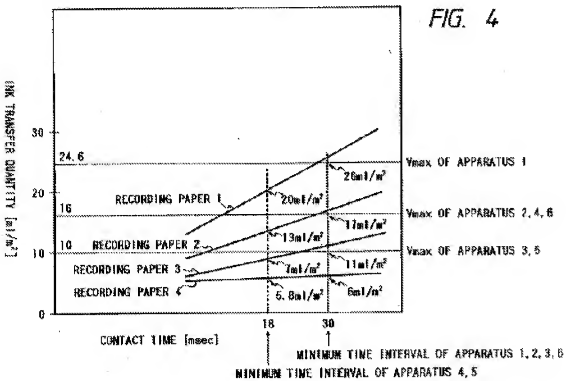
FIG. 47

b. Continuing with **claim 1,** while Koitabashi et al. teaches the method as detailed above and continues to teach using a recording material having an ink absorption amount in 100mS of 15mL/m^2 or more [i.e. 10-50 mL/m^2 for Semi-penetrative ink and 50+ mL/m^2 for high-penetrative ink] (Koitabashi et al. – Title; Abstract; Summary, Column 3, Lines 1-20; Detailed Description, Column 10, Line 64 – Column 11, Line 36; Table 1; and Figure 47, both shown above), Hirose et al. teaches an ink-jet recording method [i.e. process] which discharges inks of a first color and second color at an interval of 200msec or less [i.e. 18msec or 30 msec] (Hirose et al. – Description, Column 13, Lines 1-15), using ink with a surface tension of 25 to 45 mN/m [i.e. dyne/cm] at room temperature (Hirose et al. – Description, Column 5, Lines 30-45, particularly notice Lines 35-40), and an ink solvent containing water (Hirose et al. – Description, Column 9, Lines 20 and following). Hirose et al. continues to further elaborate on each of the teachings of Koitabashi et al. to include further detailing the use of recording material having ink

absorption amount in 100mS of 15mL/m^2 or more [i.e. 20-57 mL/m^2 for different recording paper] (Hirose et al. – Figure 4, shown below). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the details of Koitabashi et al. with the teachings of Hirose et al. to provide an ink-jet recording process that overcomes the downfalls and shortcomings of the previously known methods.

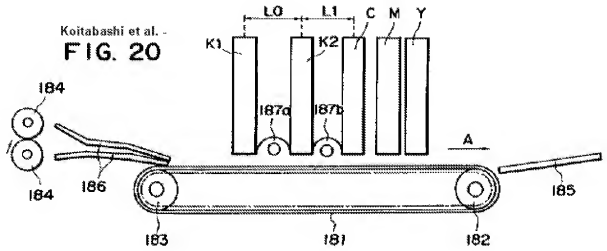
Hirose et al. -

FIG. 4



c. As related to dependent **claim 2,** the combination of Koitabashi et al. and Hirose et al. remains as applied above and continues to teach discharging the inks using a line head (Koitabashi et al. – Description, Column 21, Line 39 – Column 22, Line 67 and Figure 20, shown below).

Koitabashi et al. -
FIG. 20



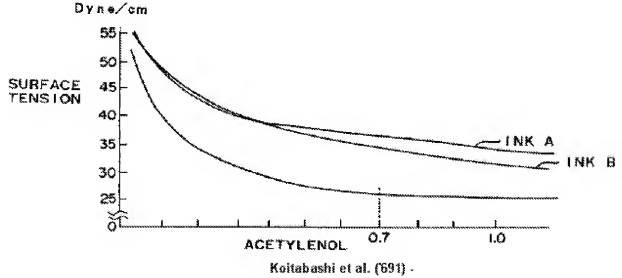
d. As related to dependent **claims 3, 7, & 9,** the combination of Koitabashi et al. and Hirose et al. remains as applied above and continues to teach the recording material has an ink absorption about in 100mS between 15mL/m^2 and 99 mL/m^2 [i.e. 10-50 mL/m^2 for Semi-penetrative ink and 50+ mL/m^2 for high-penetrative ink] and further an ink absorption amount in 100mS between 15mL/m^2 {18mL/m^2}and 40 mL/m^2 [i.e. 10-50 mL/m^2 for Semi-penetrative ink] (Koitabashi et al. – Title; Abstract; Summary, Column 3, Lines 1-20; Detailed Description, Column 10, Line 64 – Column 11, Line 36; Table 1; and Figure 47, both shown previously) [i.e. 20-57 mL/m^2 for different recording paper] (Hirose et al. – Figure 4, shown previously).

e. As related to independent **claim 4,** Koitabashi et al. teaches an ink-jet printer (Koitabashi et al. – Title) in which recording is executed by discharging inks of a plurality of colors from a discharge opening as droplets of ink to be attached onto a recording material (Koitabashi et al. – Abstract). This printer also has an interval between a discharge of an ink of a first color and a discharge of an ink of a second color

is 200 mS or less [i.e. interval of 50mS or at the same time, both of which are less than 200mS] (Koitabashi et al. – Description, Column 12, Lines 13-34 and Column 29, Lines 30-45), inks having a surface tension of 25 to 45 mN/m [i.e. dyne/cm] at 23° C [i.e. from less than 35 to more than 40 at room temperature (Heater at 0V)] and an ink solvent containing water for each of the inks of each color (Koitabashi et al. – Description, Column 11, Lines 5-16 & Column 7, Lines 40-50, Column 18, Lines 42-54 and Table 1 & Figure 47, both shown below).

Koitabashi et al. ('691) - TABLE 1

	Ka value ($ml/m^2 \cdot msec^{1/2}$)	Acetylenol content (%)	Surface tension (dyn/cm)
Topping type (non-penetrative) ink	~1.0	0.0~0.2	40~
Semi-penetrative ink	1.0~5.0	0.2~0.7	35~40
High-penetrative ink	5.0~	0.7~	~35



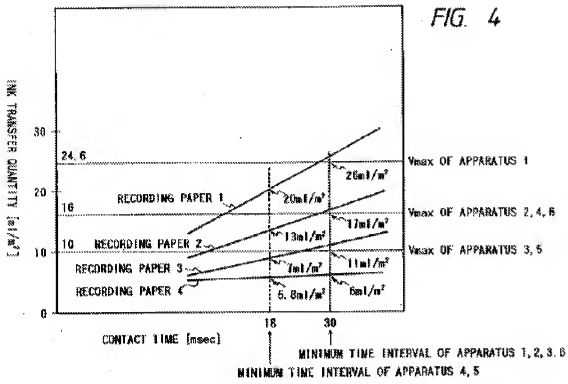
Koitabashi et al. ('691) -

FIG. 47

f. Continuing with **claim 4,** while Koitabashi et al. teaches the method as detailed above and continues to teach a recording material having an ink absorption amount in 100mS of 15mL/m^2 or more [i.e. 10-50 mL/m^2 for Semi-penetrative ink and 50+ mL/m^2 for high-penetrative ink] (Koitabashi et al. – Title; Abstract; Summary, Column 3, Lines 1-20; Detailed Description, Column 10, Line 64 – Column 11, Line 36; Table 1; and Figure 47, both shown above), Hirose et al. teaches an ink-jet printer [i.e. recorder] which discharges inks of a first color and second color at an interval of 200msec or less [i.e. 18msec or 30 msec] (Hirose et al. – Description, Column 13, Lines 1-15), an ink with a surface tension of 25 to 45 mN/m [i.e. dyne/cm] at room temperature (Hirose et al. – Description, Column 5, Lines 30-45, particularly notice Lines 35-40), and an ink solvent containing water (Hirose et al. – Description, Column 9, Lines 20 and following). Hirose et al. continues to further elaborate on each of the teachings of Koitabashi et al. to include further detailing a recording material having ink absorption amount in 100mS of 15mL/m^2 or more [i.e. 20-57 mL/m^2 for different recording paper] (Hirose et al. – Figure 4, shown below). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the details of Koitabashi et al. with the teachings of Hirose et al. to provide an ink-jet printer that overcomes the downfalls and shortcomings of the previously known devices.

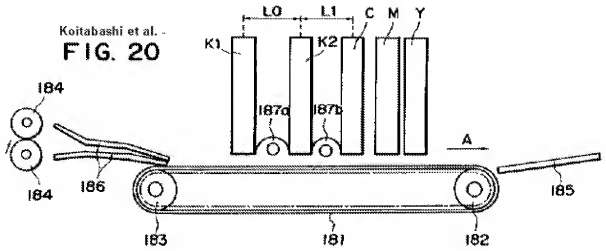
Hirose et al.

FIG. 4



g. As related to dependent **claim 5,** the combination of Koitabashi et al. and Hirose et al. remains as applied above and continues to teach the printer is a line head (Koitabashi et al. – Description, Column 21, Line 39 – Column 22, Line 67 and Figure 20, shown below).

Koitabashi et al. -
FIG. 20



h. As related to dependent **claim 6, 8, & 10,** the combination of Koitabashi et al. and Hirose et al. remains as applied above and continues to teach the recording material has an ink absorption about in 100mS between 15mL/m^2 and 99 mL/m^2 [i.e. 10-50 mL/m^2 for Semi-penetrative ink and 50+ mL/m^2 for high-penetrative ink] and further an ink absorption amount in 100mS between 15mL/m^2 {18mL/m^2}and 40 mL/m^2 [i.e. 10-50 mL/m^2 for Semi-penetrative ink] (Koitabashi et al. – Title; Abstract; Summary, Column 3, Lines 1-20; Detailed Description, Column 10, Line 64 – Column 11, Line 36; Table 1; and Figure 47, both shown previously) [i.e. 20-57 mL/m^2 for different recording paper] (Hirose et al. – Figure 4, shown previously).

5. **Claims 11-16** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Koitabashi et al.** (US 6,612,691 B1) and **Hirose et al.** (US 5,591,514 A) while referencing **Room Temperature** as applied to **claims 1 & 4**, above and further in view of **Koitabashi et al.** (US 2002/0097290 A1) and **Sakaki et al.** (US 6,174,056 B1).

a. As related to dependent **claims 11,** and further dependent **claim 12,** as well as dependent **claims 15, & 16,** the combination of Koitabashi et al. and Hirose et al. teaches the limitations of **claims 1 & 4** for the reasons above and continues to teach adding an organic solvent to the ink solvent (Hirose et al. – Description, Column 9, Lines 20-26). The combination ***does not*** specifically teach the organic solvent's percent of mass. ***However,*** both Koitabashi et al. ('290) and Sakaki et al. teach the use of similar inks with similar characteristics to include an ink solvent containing water and an organic solvent (Koitabashi et al. ('290) – Title; Abstract; Detailed Description, Page 14, Paragraph 207 and Page 16, Paragraph 229 and Sakaki et al. – Title; Abstract; Description, Column 6, Lines 1-65) these organic solvents make up 5-50% as well as 10-35% of the total mass of the inks (Koitabashi et al. ('290) – Detailed Description, Page 16, Paragraph 229 and Sakaki et al. – Ink compositions table, shown below).

(Ink compositions) Sakaki et al. -

dyes			4 parts
glycerol			6 parts
diethylglycol			6 parts
urea			8 parts
acetylene glycol (Surfynol 104, a product from Nisshin Kagaku)			x parts
water			76–x parts
dyes:			
Y:		C.I. Direct Yellow #86	
M:		C.I. Acid Red #23	
C:		C.I. Direct Blue #199	
Bk:		C.I. Food Black #2	
Ink A:	x = 0.3,	surface tension:	46 dyne/cm
Ink B:	x = 1,	surface tension:	29 dyne/cm
Ink C:	x = 3,	surface tension:	26 dyne/cm
Ink D:	x = 20,	surface tension:	21 dyne/cm
Ink E:	x = 5,	surface tension:	31 dyne/cm,

Acetylene alcohol (Surfynol 61, a product from Nisshin Kagaku) was used in place of acetylene glycol.

Ink F:	x = 1.5,	surface tension:	33 dyne/cm

Polyoxyethylene nonyl phenyl ether (Noigen EA-5, a product from Daiichi Kagaku) was used in place of acetylene glycol.

Ink G:	acetylene glycol	x = 0.4,	surface tension:	42 dyne/cm
Ink H:	acetylene glycol	x = 0.6,	surface tension:	38 dyne/cm

b. As related to dependent **claims 13 & 14** , the combination of Koitabashi et al. and Hirose et al. teaches the limitations of **claim 1** for the reasons above and continues to adding additional materials, fluids or components to the composition to improve the characteristics thereof including adjusting the surface tension of each of said inks by adding a nonionic surfactant (Koitabashi et al. – Description, Column 7, Lines 4—50). The combination ***does not*** specifically teach every single possible component that can be added as claimed by the present invention, ***However,*** Koitabashi et al. ('290) clearly teaches adding additional materials, fluids or components to the composition to improve the characteristics thereof including adding a cation surfactant or an ampholytic surfactant (Koitabashi et al. ('290) – Detailed Description – Page 16, Paragraphs 227-228) as well as adding an amine (Koitabashi et al. ('290) - Detailed Description, Page 14, Paragraph 206 – Page 15, Paragraph 207). ***Meanwhile,*** Sakaki et al. further continues the teachings to include adding additional materials, fluids or components to the composition to improve the characteristics thereof including adding any of a variety of the claimed surfactants as well as pH adjusters, amines, preservatives, and ultraviolet absorbers (Sakaki et al. – Column 4, Lines 10-16 & Lines 24-55 and Column 6, Lines 1-65) to each of the inks at some point in the recording process or preparation therefore.

Given the same field of endeavor, specifically an ink-jet printer which merely discharges ink and uses recording material, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the method and apparatus of ink-jet recording using any of a variety of available inks as taught by the combination of Koitabashi et al. and Hirose et al. teaches with the specific ink-jet recording ink that was readily available to one of ordinary skill in the art at the time of

the invention, with the further detailed depiction of the ink in use as taught by both Koitabashi et al. ('290) and Sakaki et al. in an effort to use the most effective ink available as an improvement over the existing options at the time particularly in super high speed printers with full line head printing capabilities (Koitabashi et al. ('290) – Detailed Description, Paragraph 42), while merely using that which was available to one of ordinary skill in the art at the time of the invention, in this case to the same inventor [i.e. Koitabashi et al.].

Response to Arguments

6. Applicant's arguments filed 11 August 2010 have been fully considered but they are not persuasive.

7. With respect to **claims 1 & 4** and therefore **claims 2-3 & 5-16,** which inherently contain all of the limitations of either independent **claim 1** or **claim 4,** Applicant argued that "Koitabashi cannot be fairly viewed as disclosing an ink with a surface tension of 25 to 45 MN/m at 23 degrees C because Koitabashi does not disclose the temperature…" and that "Sakaki and Hirose fail to cure this defect."

8. In response to Applicant's argument that "Koitabashi cannot be fairly viewed as disclosing an ink with a surface tension of 25 to 45 MN/m at 23 degrees C because Koitabashi does not disclose the temperature…" a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Additionally, Applicant avoids the fact that the critical element as laid out in the specification is ***NOT*** the temperature at which the surface tension of the ink was measured, but rather is the actual range of the surface tension

(Specification, Disclosure, Page 4; Specification, Best Mode, Page 9) and that the inks have to fall into that range (Specification, Pages 15 & 18 & Tables 1-4). Inks do in fact have a range of surface tensions in a range of temperatures. As one of ordinary skill in the art at the time of the invention could tell, the range for room temperature for typical scientific measurements is 20 to 25°C (68 to 77°F), the fact that Applicant chose to measure the Surface Tension of the ink at 23°C instead of 25°C or instead of 20°C is irrelevant. There is nothing in the specification that indicates the ink is controlled at 23°C throughout the printing procedure and there needn't be, as the temperature element is not the critical element of the claimed limitation. Therefore, as mentioned above, Koitabashi et al. not only teaches the range of Surface Tensions claimed, but teaches the range of temperature over which the change in the range of the surface tension would be negligible at best. Additionally, in the portion of the specification noted by Applicant, Koitabashi et al. actually mentions a difference between the penetrativeness of the ink when there was a heater that heated the ink [i.e. temperature above room temperature] and when there was no heater [i.e. temperature of ink not raised above room temperature], and finally, Examiner respectfully points out, as detailed above, that Koitabashi et al. does in fact teach printing in an environment void of heat or a heating mechanism. This would be referred to as room temperature 20 to 25°C which would certainly include the claimed temperature of 23°C, despite Applicant's lack of any indication in the specification that the temperature of 23°C is critical to the operation.

9. With regard to Applicant's final argument that "Sakaki and Hirose fail to cure this defect" Examiner respectfully points Applicant to the rejection as put forth previously and reiterated above while further indicating that while Hirose et al. does teach an ink having a

surface tension of 45 to 50 dyne/cm [45 to 50 mN/m] as Applicant mentions, Hirose et al. also teaches ink with a surface tension of 25 to 35 dyne/cm [25 to 35 mN/m] which is in a narrower range and therefore inclusive of the present claimed range of 25 to 45 mN/m. This combined with the fact that the surface tension of inks in the range of 25 to 45 mN/m [i.e. dyne/cm] at 23° C would not have a noticeable change in surface tension throughout the accepted room temperature range 0 to 25°C which would certainly include the claimed temperature of 23°C. The range encompassed by the claim far surpasses the actual changes in the surface tension throughout the accepted room temperature range. As no further arguments were made, all dependent claims have been rejected accordingly.

Conclusion

10. ***Examiner's Note:*** Examiner has cited particular Figures & Reference Numbers, Columns, Paragraphs and Line Numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Zimmermann whose telephone number is (571)270-3049. The examiner can normally be reached on Monday - Thursday, 7:00am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on 571-272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW LUU/
Supervisory Patent Examiner, Art Unit 2861

JPZ